

## **Fingerprints vs. DNA**

Just because an item has been touched doesn't mean that a fingerprint will be left. The same is true for DNA. Until the evidence is examined and analyzed, there is no way to really know if DNA is there, just like known prints for comparison for latent prints.

## **DNA Testing at the KBI Laboratory**

The KBI Laboratory Biology Sections in Great Bend, Kansas City and Topeka are using a DNA technology known as PCR (Polymerase Chain Reaction). This type of DNA technology will amplify targeted areas of the DNA called short tandem repeats (STRs). These STRs are analyzed and a DNA profile is generated.

The KBI Laboratory has generated DNA profiles from the more typical items, such as seminal fluid stains and blood stains, but also from items such as cigarette butts, gloves, stocking caps, tobacco juice stains and hair.

## **Evidence Collection, Packaging and Storage**

Officers and laboratory personnel should work together to determine the most significant pieces of evidence and to establish priorities for the samples submitted.

Since only a few cells can be sufficient to generate a DNA profile, it is important to pay attention to the details when collecting the potential DNA evidence.

When you are collecting evidence for DNA analysis, do not sneeze, cough, or touch your face and then touch the area on the evidence that may contain DNA. Remember that the new DNA technology is sensitive enough to generate a profile with only a few nucleated cells.

Collect the samples wearing disposable latex gloves and change the gloves often. If swabs are used, it is better if they are sterile and that the water is sterile or de-ionized. If the swabs used are not sterile or a different source of water is used, then a control swab should be submitted. For any questions about the collection of samples, please do not hesitate to call the KBI Laboratory Biology Section in an area nearest you.

When at all possible, submit the entire item. If you can not submit the entire item, then cut out the area of interest. Swabbing can be done, but it is important to be careful that you do not dilute the DNA sample. If you have any questions, please contact the KBI Laboratory Biology Section.

For transporting and storing DNA it is important to keep the evidence dry and at room temperature. Evidence with the potential of DNA should be placed in paper. Do not place evidence that may contain DNA in plastic bags because plastic bags will retain moisture. Direct sunlight and warm conditions are also harmful to DNA. Avoid keeping evidence in places that may get hot, such as a room or car without air conditioning.

## **DNA Evidence Collection Supplies**

1. Tweezers
2. Scissors
3. Cotton tip swabs
4. Scalpels and blades
5. Sheets of paper(for druggist folds)
6. Paper bags and envelopes
7. Cardboard boxes for packaging
8. Distilled water and a small bottle
9. Evidence tape
10. Bleach solution
11. Isopropyl alcohol (rubbing alcohol)
12. Mask, goggles, gloves, and disposable shoe covers
13. Plastic biohazard bags for contaminated items
14. Paper towels
15. Permanent marking pens

## **Reference Samples**

It is important to have the reference samples, either blood or oral swabs, from any person who may have left DNA on an item of evidence. This allows DNA profile comparisons to be done between the DNA profile(s) obtained from the evidence and the DNA profile(s) obtained from known person(s). For example, with rape cases, it may be necessary to obtain reference samples from consensual partner(s) the victim may have had.

## **CODIS**

CODIS – Combined DNA Index System is an automated DNA information processing and telecommunications system that supports the National DNA Index System (NDIS), State DNA Index System (SDIS).

CODIS generates investigative leads in crimes where biological evidence is recovered from the crime scene using two indexes: the Forensic and Offender Indexes.

The Forensic Index contains DNA profiles from crime scene evidence.

The Offender Index contains DNA profiles from individuals convicted of sex offenses and other violent crimes.

Matches made among profiles in the Forensic Index can link crime scenes together, possibly identifying serial offenders. Based on a match, police in multiple jurisdictions can coordinate their respective investigations and share the leads they developed independently.

Matches made between the Forensic and Offender Indexes provide investigators with the identity of the possible perpetrator(s). After CODIS identifies a potential match, qualified DNA examiners in the laboratories responsible for the matching profiles contact each other to validate or refute the match.

# DNA

With the changes in the DNA technology, it is important for officers to re-examine the way evidence is collected and preserved. Even with old cases, the new DNA technology is sensitive enough to provide the option of re-analyzing evidence previously thought to be of little or no evidentiary value. It is important to have a working knowledge of the ways to identify, preserve, and collect DNA evidence properly.

## What is DNA?

DNA stands for deoxyribonucleic acid. DNA is the fundamental building block for an individual's entire genetic makeup. It is found in nearly every cell in the body. DNA from blood is the same as the DNA in skin cells, semen, and saliva.

DNA can be a powerful tool because everyone's DNA is different from every other person's, except for identical twins. Therefore, DNA collected from a crime scene can either link a suspect to the evidence or eliminate a suspect.

DNA can also be found on evidence that is decades old. However, environmental factors such as heat, sunlight, moisture, bacteria, and mold can degrade DNA. Therefore, not all DNA evidence will result in a usable DNA profile.



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***If you have questions on DNA, or would like  
more information on how DNA can aid in  
your criminal investigation, contact the KBI  
Forensic Laboratory in your area.***

# DNA

## The Newest Implementation of the Technology

